

NASA Langley's Biodiesel Purification

Via an electric field assist

Researchers at NASA's Langley Research Center have developed a low-cost, water-free method of removing ionic impurities such as sodium from biodiesel. Manufacturers and researchers will be able to benefit from this new technology and its novel purification method. Initial advantages will be seen in methods that are energy or water intensive. The invention works by passing electricity through a graphite matrix, which creates an electromagnetic field. As the biodiesel is pumped through the matrix, the positively charged sodium ions are attracted to the negatively charged side of the graphite matrix, thereby removing them from the liquid. The technology can be readily incorporated into existing production methods and transitioned to the marketplace. NASA is seeking market insights on commercialization of this new biodiesel purification method, and welcomes interest from potential producers, users, and licensees.

Benefits

- Low-cost biodiesel cleaning
- Reduced water consumption
- In-line high-throughput cleaning
- Removal of toxic metals

partnership opportunity





Applications

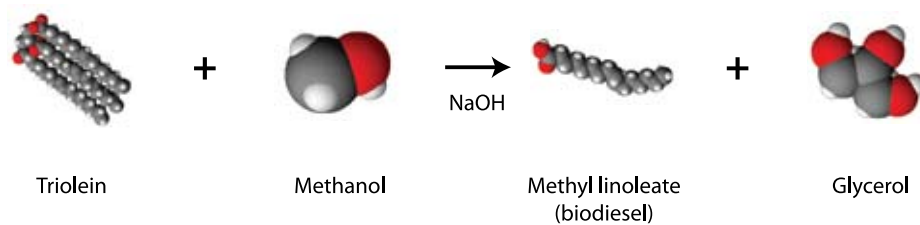
The technology has multiple applications in the general area of separation of ionic chemicals from liquids. Specific uses include:

- Biodiesel production
- Water purification
- Removal of heavy metals
 - lead
 - mercury
 - arsenic

The Technology

The innovation is a novel method of water-free removal of ionic substances from a liquid. In biodiesel production, sodium hydroxide is used in the transesterification process required to convert triolein and methanol into methyl linoleate (biodiesel) and glycerol. After the process is completed, the residual sodium must be removed prior to use. NASA's technology produces an electromagnetic field between two carbon electrode matrixes immersed in unwashed biodiesel. As the liquid is pumped through the matrix housing, the positively charged sodium ions are attracted to the negative electrode. The biodiesel is not an ionic molecule, and as such, it will pass through the matrix unimpeded.

The invention was developed as an alternative method to remove ionic molecules from liquids. Current methods require the costly use and disposal of distilled water. At NASA, it is important to identify purification methods that are not resource intensive. By developing an alternative method of liquid purification, NASA is able to reduce mission resource requirements.



Transesterification of triolein to produce biodiesel

For More Information

If your company is interested in licensing or joint development opportunities associated with this technology, or if you would like additional information on partnering with NASA, please contact:

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